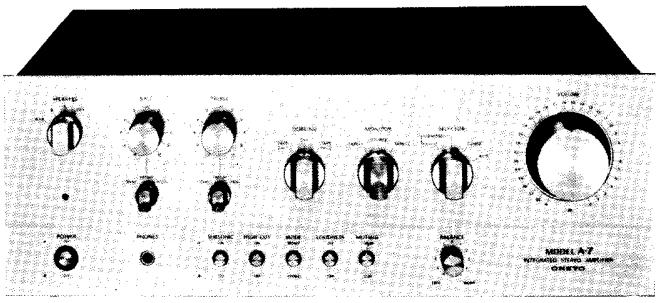
ONKYO® SERVICE MANUAL

INTEGRATED STEREO AMPLIFIER

Model A-7



SPECIFICATIONS

Model A-7 Integrated Stereo Amplifier

Power Supply Rating	AC 120 Volts 60 Hz (USA Model) AC 110V/120V/220V/240V 50Hz/60Hz (Universal Model)
Controls	POWER SPEAKERS (OFF, A, B, A+B) SELECTOR (PHONO 1, PHONO 2, TUNER, AUX) TAPE MONITOR (TAPE 1, SOURCE, TAPE 2) TAPE DUBBING (TAPE 2-1, OFF, TAPE 1-2) VOLUME, BALANCE, BASS, TREBLE, TURN OVER SWITCH BASS (125Hz, DEFEAT, 400Hz) TREBLE (2kHz, DEFEAT, 8kHz) MUTING, LOUDNESS, MODE, HIGH FILTER, SUB-SONIC FILTER
Outputs	SPEAKER A & B, PHONES TAPE REC 1 & 2, PRE OUT
Inputs	PHONO 1 & 2 TUNER AUX TAPE PLAY 1 & 2 MAIN IN
Dimensions	17½"(W) x 6¼"(H) x 15"(D) 444 x 159 x 380 mm
Weight	29.7 lbs. 13.5 kg.

Power Amplifier Section

Power Output (through AUX inputs)	70 watts per channel, min. RMS, at 4 Ohms both channels driven, from 20 Hz to 20 kHz, with no more than 0.1% total harmonic distortion. 65 watts per channel, min. RMS, at 8 ohms both channels driven, from 20 Hz to 20 kHz, with no more than 0.1% total harmonic distortion. 75 watts per channel, min. RMS, at 4 ohms both channels driven, 1 kHz, 0.1% total harmonic distortion. 68 watts per channel, min. RMS, at 8 ohms both channels driven, 1 kHz, 0.1% total harmonic distortion.
Total Harmonic Distortion (AUX)	0.1% at rated power 0.08% at 1 watt output
IM Distortion (AUX) (70Hz : 7kHz = 4 : 1)	0.1% at rated power 0.08% at 1 watt output
Frequency Response	2-80,000 Hz (±1 dB)
Tilt	better than 5% at 50 Hz
Signal to Noise Ratio	110 dB (IHF A NETWORK)
Damping Factor	50 at 8 ohms
Rated Input	1.5 volts
Input Impedance	100 k-ohms
Load Impedance	4–16 ohms

Preamplifier Section

Input Sensitivity & Impedance	PHONO 1 & 2: 2.5mV, 50 k-ohms TUNER: 150mV, 50 k-ohms AUX: 150mV, 50 k-ohms TAPE PLAY 1 & 2: 150mV, 50 k-ohms
Total Harmonic Distortion	0.05% at rated output
IM Distortion (70Hz : 7kHz = 4 : 1)	0.08% at rated output
Frequency Response	PHONO: ±0.2 dB at 30–15,000 Hz AUX: +0, –1 dB at 10–50,000 Hz
Phono Overload	230mV RMS. at 1 kHz, 0.1% THD.
Signal to Noise Ratio	PHONO: 80 dB (IHF A NETWORK) AUX: 90 dB (IHF A NETWORK)
Output Voltage	1.5 volts, max 15 volts
Output Impedance	2.7 k-ohms
Tone Control BASS	±10 dB at 100 Hz (turnover at 400 Hz)
TREBLE	±10 dB at 10 kHz (turnover at 2 kHz)
Turnover Frequency	BASS: 400 Hz, 125 Hz TREBLE: 2 kHz, 8 kHz
Filters SUBSONIC	10 Hz (6 dB/oct.)
HIGH	5 kHz (6 dB/oct.)
Muting	–20 dB
Loundness (–40 dB)	+5 dB at 100 Hz +5 dB at 10 kHz

Specifications are subject to change without notice.

ONKYO®
AUDIO COMPONENTS

SERVICE PROCEDURES

1. Checking the operation of the protective circuit.

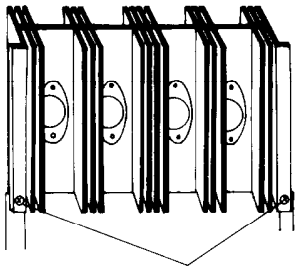
The protective circuit of the A-7 works in the following manner: A fuse burns out if speaker of too low impedance are connected, or if the speaker wires are accidentally shorted. A relay cuts-off output from the amplifier if due to malfunction DC current appears at the output terminals. The relays will also be actuated in the event of excessive output current. A check of the protective circuit is made by placing the unit in the following sequence of settings.

1) No load.
2) Set all controls at the levels set on the power amplifier (refer to power amplifier).
3) Set the SELECTOR switch to PHONO.
4) Apply a 5Hz, 1V (RMS) sine wave to the PHONO inputs.
5) Gradually increase the setting of the master volume control. The protective circuit relay should activate as a result of this.

Note: Operation of tht protective circuit relay can also be checked by setting the center voltage at DC 4V and removing the fuses F701 and F702, and then applying a DC ±5V voltage to the output terminals. This should actuate the relay.

2. Checking the circuit board of the power amplifier.

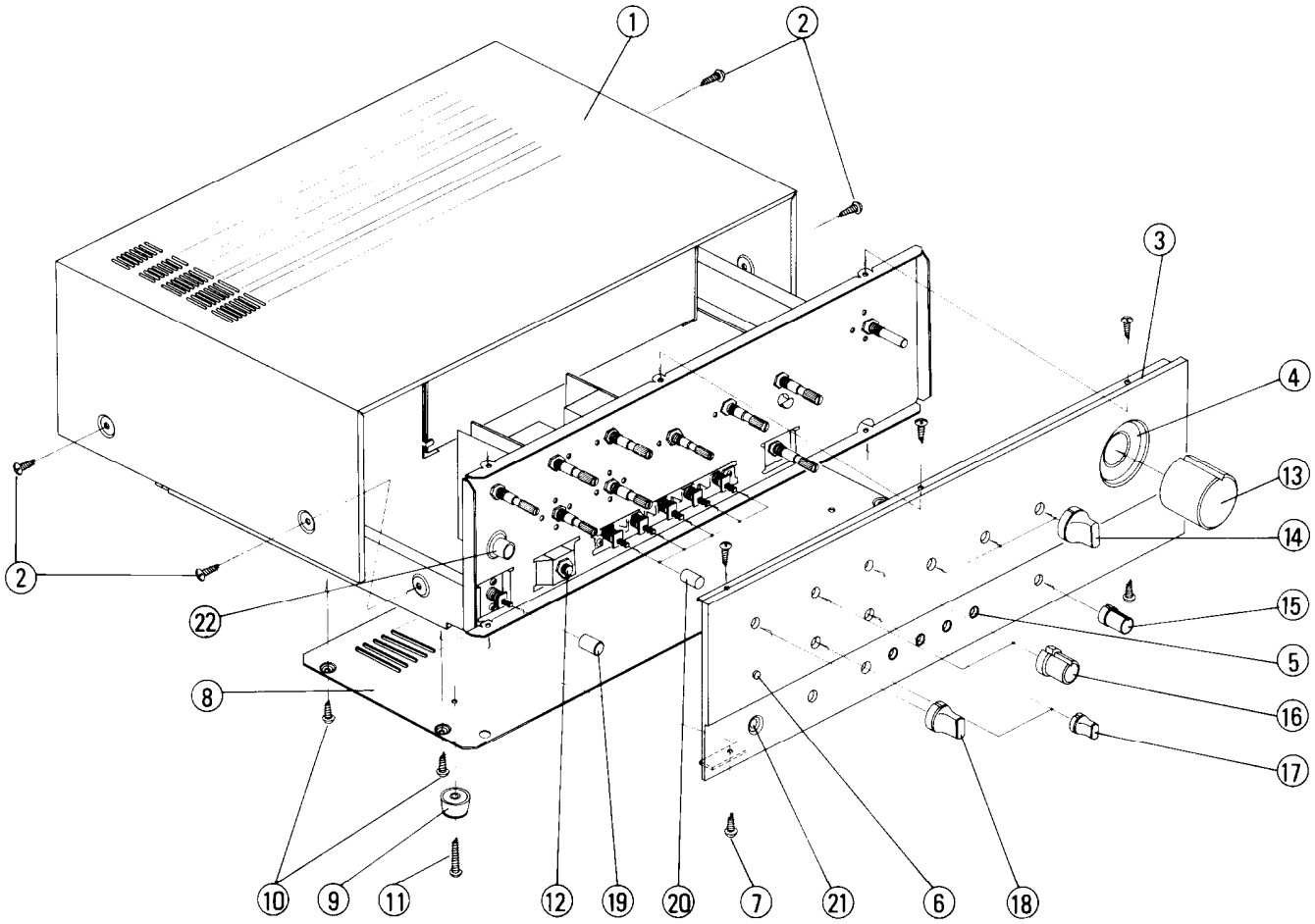
1) Remove two lower screws from the heat sink.
2) Remove two screws on the back of the heat sink.
3) Remove two heat-sensor transistors Q613 and Q614 from the heat sink. If they cannot be pulled out, remove two mounting screws from the transistor sockets.
4) The check can also be performed by fastening it as shown in Fig. 1 with screws that have been removed.



Screw Fig. 1

3. The screws used to fasten the bus grounding strips and the terminals of the power supply electrolytic capacitor have can influence sound quality. They must be tightened securely.
4. When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of both channels have the the same h_{FE} ratings.

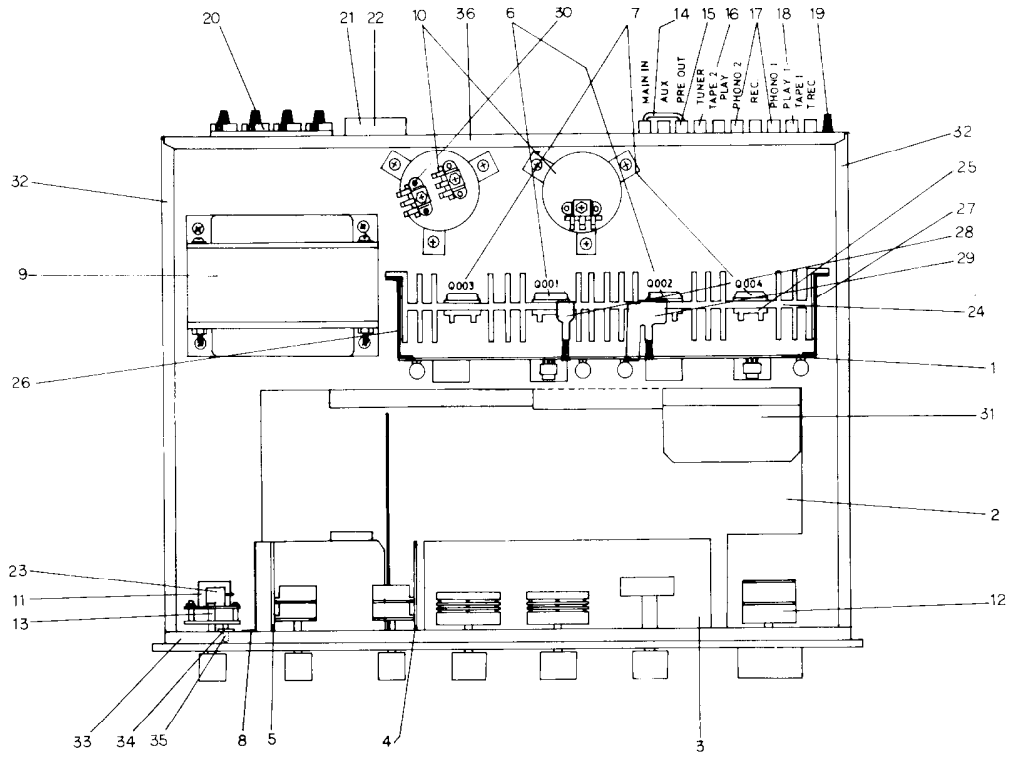
COMPONENT LOCATION



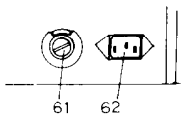
PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1	28184017A	Top Cover	12	250126	Headphone Jack 3P64M
2	838440109	Screw 4TTB+10C (BC)	13	28320155	Knob-Volume
	12829121	Front Panel Ass'y (3 ~ 7)	14	28320158	Knob-Selector
3	27210069	Front Panel	15	28320157	Knob-Level
4	27265009A	Ring	16	28320161	Knob-Tone
5	27267014	Knob Guide	17	38320163	Knob-Shift
6	28198502	Facet	18	28320162	Knob-Push
7	27267015	Knob Guide	19	28320159	Knob-Power
8	27170019	Bottom Board	20	28320160	Knob-Push
9	280379	Leg	21	838130062	Tapping Screw 3STB+6BQ
10	831130082	Tapping Screw 3STW+8BQ	22	270611	Pilot Lamp Cover
11	832140122	Tapping Screw 4STR+12BQ			

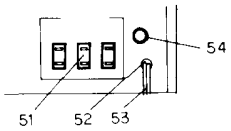
COMPONENT LOCATION



TOP VIEW



Universal Model



USA Model

PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION
1	12829576A	Main Amp. P.C.B. NAMA-376a
2	12829575A	Rectifier/Preamp P.C.B. NAAF-375a
3	12838573	Switch P.C.B. NATM-373
4	128385741	Treble Control P.C.B. NATS-374 Part 1
5	128385742	Bass Control P.C.B. NATS- 374 Part 2
6	2200592 or	Power Amp. Transistor
	2200593	2SD426 (R) or 2SD426 (O)
7	2200582 or	Power Amp. Transistor
	2200583	2SB556 (R) or 2SB556 (O)
8	27150048	Shielded Plate
9	230187	Power Transformer NPT-608D
10	3504097	Elect. Capacitor 25000μF 55V
11	25035050	Power Switch NPS-111-L15P
12	5104041	Variable Resistor N35
		DGR32C100KT30M, Volume Control
13	25030073	Rotary Switch NRS-124-30Y,
		Speaker Selector
14	25055015	Connection Bar
15	25045029	TAPE, PRE OUT, MAIN IN Terminal
16	25045025	TUNER/AUX Input Terminal
		NPJ-4PRBL03
17	250170	Phono Terminal NTM-2WPBL-E1
18	25045022	Tape Terminal NPJ-6PRBL03
19	25060008	Ground Terminal
20	25060023	Speaker System Terminal
		NTM-4PRMN01
21	25050004	Fuse Holder with Cover
22	252020	Speaker Fuse 5A-T
23	3504012	UL Capacitor 0.01μF 125V

REF. NO.	STOCK NO.	DESCRIPTION
24	27160019	Heat sink
25	250249	Power Transistor Socket M-1614
26	27140122	Heatsink Bracket Left
27	27140123	Heatsink Bracket Right
28	27140085A	Transistor Socket A
29	27140157	Transistor Socket B
30	25060025	7P Lug Plate
31	27150055	Shielded Plate
32	27115014A	Side Bracket
33	27110031	Front Bracket
34	28140024	Cushion
35	210015A	6.3V 50mA Power Indicator Lamp
36	27120069	Back Panel
51	25050015	AC Outlet NSCT-6P01
52	270025	Strainrelief SR-3P-4
53	253072	AC Cord AS-UC
54	250080	AC Fuse Holder S-N1301
55	252049	AC Fuse 4A ST-6

The Universal type differs from the UDN type (USA model) at the following points.

9	230188	Power Transformer NPT-608ADGQ
11	25035051	Power Switch NPS-121-L16P
23	3500052	IS Capacitor PME271Y510CEE
36	27120071	Back Panel
51–55		none
61	250186	VS Socket S-I7205-7
62	25050018	3P Inlet
63	252003	Fuse 3A-T

MAIN AMP. (NAMA-376a)

MAIN AMP. PC BOARD-PARTS LIST

CIRCUIT NO.	STOCK NO.		DESCRIPTION
	Transistors		
Q601~Q604	2210754 or 2210755	2SC1775A(D) or 2SC1775A(E)	Differential Amp.
Q605~Q608	2211084 or 2211085	2SA872A(D) or 2SA872A(E)	Differential Amp.
Q609. Q610	2211032 or 2211033	2SA912(Q) 2SA912(R)	Driver Amp.
Q611, Q612	2211022 or 2211023	2SC1885(Q) 2SC1885(R)	Driver Amp.
Q613, Q614	2210743 or 2210744	2SC945 Ⓛ (P) 2SC945 Ⓛ (Q)	Bias Stabilization
Q615, Q616	2200364	2SD358(D)	Complement
Q617, Q618	2200354	2SB528(D)	Complement
	Diodes		
D601~D604	223105	1S1555	

BOTTOM VIEW

CIRCUIT NO.	STOCK NO.		
	Coils		
L601, L602	231001	S-1.3B	
	Capacitors		
C605, C606	390480477	4.7μF 50V	LD
C619, C620	352744711	470μF 16V	EL
C625, C626	374121045	0.1μF±10% 50V	DE
C631, C632	374121044	0.1μF± 5% 50V	DE
C633~C636	352770331	3.3μF 63V	EL
	Variable Resistors		
R607, R608	5221008	R-HK4.7KB3S	CENTER VOLTAGE
R645, R646	5221007	R-HK2.2KB3S	IDLING CURRENT
	Resistors		
R651, R652 R657, R658	451630274	2.7 ohm 1W	Metal
R659~R662	48114795	0.47 ohm 5W	Cement

NOTES: When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of one channel have the same h_{FE} ratings.

MAIN AMP. ALIGNMENT

NOTES: 1. Set up A-7 as follows:
SELECTOR ... AUX TONE SHIFT .... DEFEAT
TONE & BALANCE ... Center
FILTER/LOUDNESS/DUBBING ... OFF
MODE ... STEREO T.MONITOR ... SOURCE
SPEAKERS ... OFF VOLUME ... Maximum (0dB)
2. Adjust after switching on for 3 minutes.

1. IDLING CURRENT ADJUSTMENT
Connect the DC Voltmeter between I_{ID} and V_{CT} terminals.
Adjust the Voltage to 17±2mV with R645. (Left channel)
Adjust the Voltage to 17±2mV with R646. (Right channel)

2. CENTER VOLTAGE ADJUSTMENT
Connect the DC Voltmeter between V_{CT} and E terminals.
Adjust the Voltage to 0±5mV with R607. (Left channel)
Adjust the Voltage to 0±5mV with R608. (Right channel)

CIRCUIT NO.	STOCK NO.		
	Resistors		
R663, R664	451630684	6.8 ohm 1W	Metal
R667, R668	451731004	10 ohm 2W	Metal
R671, R672	441521014	100 ohm 1/2W	Metal Oxide Film
	Themistors		
TH601,TH602	4000003	D-22A	

SWITCH PC BOARD-PARTS LIST

	Rotary Switches			
S101	25030069	NRS-144-30ZL	SELECTOR	$5.30
S102	25030068	NRS-143-30A	DUBBING	
S103	25030068	NRS-143-30A	MONITOR	

TONE CONTROL PC BOARD – PARTS LIST

	Capacitors		
C403, C404	374122044	0.2μF±5% 50V	DE
C407, C408	374121144	0.11μF±5%50V	DE
C409, C410	390882207	22μF±50V	SLD
C413, C414	372328214	820pF±5% 50V	ST
	Rotary Variable Resistors		
R401	5104042	GH30E-196K x 2	BASS
R413	5104043	GH30E-171K x 2	TREBLE
	Rotary Switches		
S401, S402	25030072	NRS-143-30ZV	FREQUENCY SHIFT

Capacitor
DE: Non-Inductive Polyester Film Capacitor.
LD, SLD: Low Leakage Current Type Electrolytic Capacitor.
ST: Polystyren Film Capacitor.
EL: Electrolytic Capacitor.

BOARD VIEW
EQUALIZER/TONE AMP. PC BOARD (NAAF-375a)

CIRCUIT NO.	STOCK NO.	DESCRIPTION	
	Transistors		
Q201–Q204	2210665 or 2210666	2SA841 (GR) or 2SA841 (BL)	Differential Amp.
Q205, Q206	2210665 or 2210666	2SA841 (GR) or 2SA841 (BL)	Equalizer Amp.
Q207, Q208	2210675 or 2210676	2SC1681 (GR) or 2SC1681 (BL)	Equalizer Amp.
Q209, Q210	2211042 or 2211043	2SC1318 (Q) or 2SC1318 (R)	Equalizer Amp.
Q211, Q212	2211052 or 2211053	2SA720 (Q) or 2SA720 (R)	Equalizer Amp.
Q301–Q304	2210665, 2210666, 2210416 or 2210417	2SA841 (GR) 2SA841 (BL) 2SA726 (F) or 2SA726 (G)	Differential Amp.
Q305, Q306	2210675 or 2210676	2SC1681 (GR) or 2SC1681 (BL)	Tone Amp.
Q501	2200663 or 2200664	2SC1626 (O) or 2SC1626 (Y)	Rectifier
Q502	2200673 or 2200674	2SA816 (O) or 2SA816 (Y)	Rectifier 2.00
Q701~Q703	2211182, 2211183, 2210361 or 2210362	2SC1740 (Q), 2SC1740 (R), 2SC828A (Q) or 2SC828A (R)	Protector
Q704	2210863	2SC1212AWT (C)	Protector

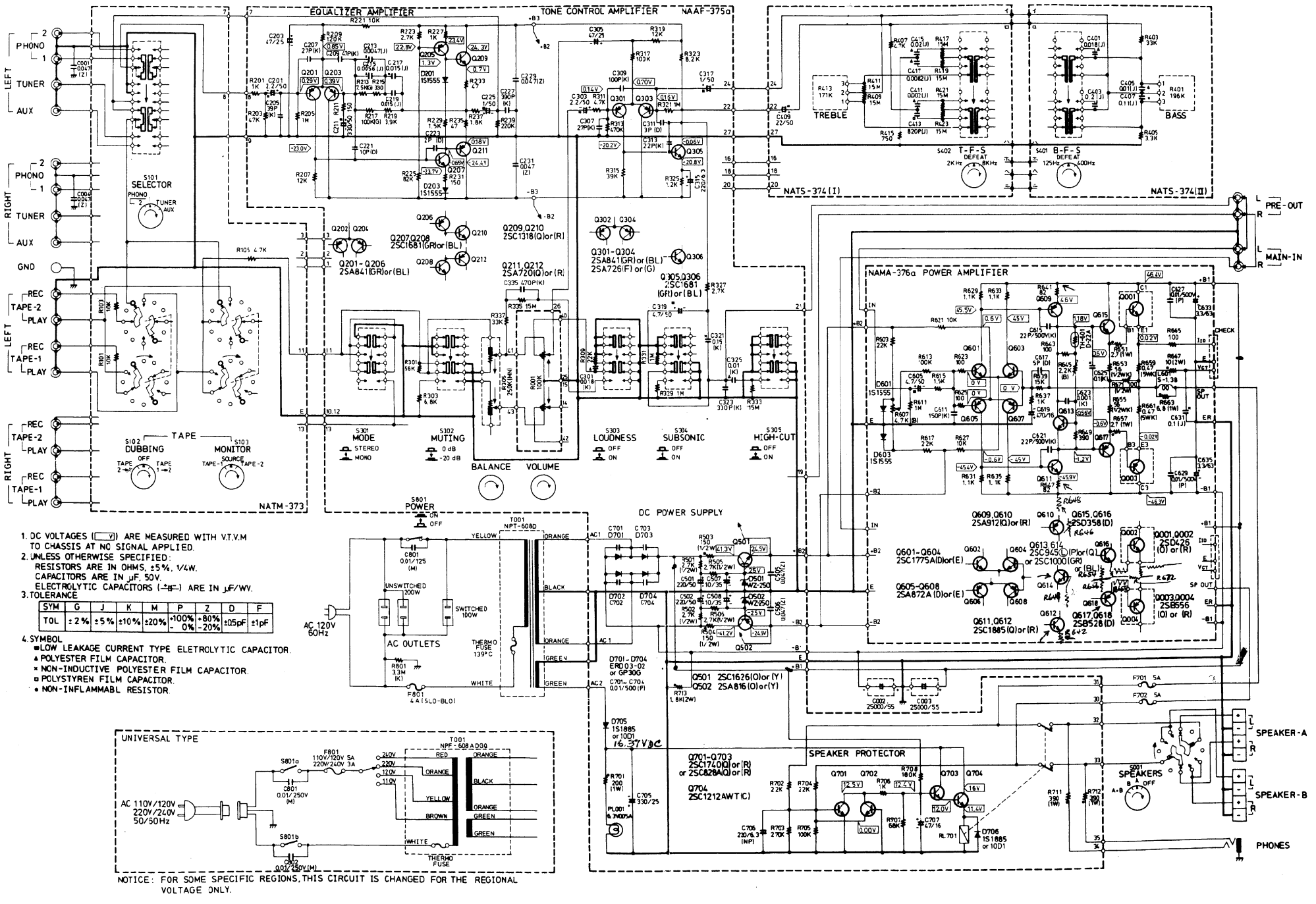
NOTES: When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of one channel have the same h_{FE} ratings.

CIRCUIT NO.	STOCK NO.	DESCRIPTION		
	Diodes			
D201–D204	223105	1S1555		
D501, D502	224018	WZ-250	0.75	
D701–D704	223832 or 223841	ERD03-02 or GP30G	or	
D705, D706	223802 or 223801	1S1885 or 10D1	or	
	Capacitors			
C201, C202 C303, C304	390480227	2.2μF	50V	LD
C203, C204 C305, C306	352754701	47μF	25V	EL
C211, C212	390883317	330μF	50V	SLD
C213, C214	374124724	4700pF ±5%	50V	DE
C215, C216	374125624	5600pF ±5%	50V	DE
C217, C218 C219, C220	374121534	0.015μF ±5%	50V	DE
C225, C226 C317, C318	390480107	1μF	50V	LD
C315, C316	352722211	220μF	6.3V	EL
C319, C320	390480477	4.7μF	50V	LD
C321, C322	374121545	0.15μF ±10%	50V	DE

CIRCUIT NO.	STOCK NO.	DESCRIPTION			
	Capacitors				
C501, C502	352782211	220μF	50V	EL	
C507, C508	352761001	10μF	50V	EL	1.00
C705	352753311	330μF	25V	EL	
C706	352322216	220μF	6.3V	NP	
C707	352744701	47μF	16V	EL	
	Resistors				
R305	5148013 or 5148011	N16RGL250KMN30, Variable, BALANCE			#3
R503, R504	441521514	150 ohm	1/2W	Metal Oxide Film	1.00
R701	441622014	200 ohm	1W	Metal Oxide Film	
R711, R712	441623914	390 ohm	1W	Metal Oxide Film	
R713	441721824	1.8 kohm	2W	Metal Oxide Film	
	Switches				
S301~S305	25035039	NPS-542-L04		Push	
	Relay				
RL701	250166	NRS2P5A-DC12			
	27300059	Ground Plate			
	27150049	Shielded Plate			

Capacitor
DE: Non-Inductive Polyester Film Capacitor.
LD, SLD: Low Leakage Current Type Electrolytic Capacitor.
ST: Polystyren Film Capacitor.
EL: Electrolytic Capacitor.

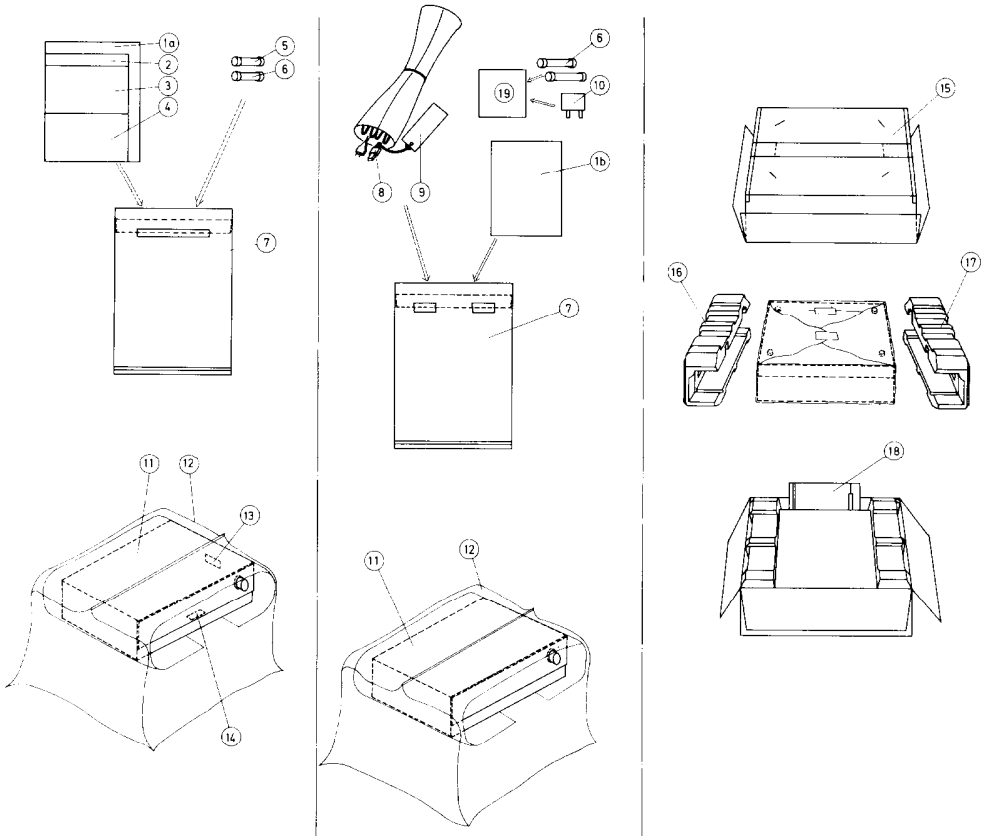
SCHEMATIC DIAGRAM



1. DC VOLTAGES (V) ARE MEASURED WITH V.T.V.M TO CHASSIS AT NO SIGNAL APPLIED.
2. UNLESS OTHERWISE SPECIFIED:
   RESISTORS ARE IN OHMS, ±5%, 1/4W.
   CAPACITORS ARE IN μF, 50V.
   ELECTROLYTIC CAPACITORS (±) ARE IN μF/WV.
3. TOLERANCE

SYM	G	J	K	M	P	Z	D	F
TOL	±2%	±5%	±10%	±20%	+100% - 0%	+80% -20%	±0.5pF	±1pF

4. SYMBOL
   ■ LOW LEAKAGE CURRENT TYPE ELETROLYTIC CAPACITOR.
   ▲ POLYESTER FILM CAPACITOR.
   × NON-INDUCTIVE POLYESTER FILM CAPACITOR.
   ◘ POLYSTYREN FILM CAPACITOR.
   • NON-INFLAMMABL RESISTOR.



USA Model Universal Model

USA Model

- All printed materials and accessory items are placed in a poly bag and taped.
- The AC power cord is wrapped in paper and wound with a rubber band.
- A tag describing the composition of the cabinet is attached to the speaker switch.
- Four shorting pins are inserted in the phono terminals.

Universal Model

- The AC power cord is wrapped in paper and wound with a rubber band.
- There is a voltage tag to which the unit is set attached to the AC power cord.
- All printed materials and accessory items are placed in a poly bag and taped.
- Four shorting pins are inserted in the phono terminals.

PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION
1a	29340193	Instruction Manual
1b	29340195	Instruction Manual
2	29358001	Service Station List
3	29355046	Caution Card for Warranty Card
4	29365003	Warranty Card
5	252049	4A, ST-6, Fuse
6	252020	5A-T, Fuse
7	29100006A	250 x 350 (m/m), Poly Bag
8	253083	Power Supply Cord
9	293268	Tag, Voltage
10	25055018	CV-K-1, Conversion Plug
11	290008	500 x 1000 (m/m), Sheet
12	29100027	850 x 650 (m/m), Poly Bag
13	282969	Caution Label A
14	293041	Caution Label
15	29050112	Carton Box
16	29090178	Pad, Left
17	29090179	Pad, Right
	250153	Shorting Pin
	29380025	Tag, Cabinet Composite
19	29100002	150 x 80(m/m), Poly Bag